A STUDY ON KNOWLEDGE, ATTITUDE AND PRACTICES ON ORAL REHYDRATION THERAPY AMONG MOTHERS OF UNDER-FIVE CHILDREN IN THE SLUMS OF CHENNAI.

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CERTIFICATE

This is to certify that the dissertation on **'A STUDY ON KNOWLEDGE, ATTITUDE AND PRACTICES ON ORAL REHYDRATION THERAPY AMONG MOTHERS OF UNDER-FIVE CHILDREN IN THE SLUMS OF CHENNAI'** is a bonafide work carried out by **Dr. K. SUNITHA,** post-graduate student in Institute of Community Medicine, Madras Medical College, Chennai–3 during 2008-2011, under my guidance and supervision in partial fulfillment of the requirement laid down by The Tamilnadu Dr.M.G.R. Medical University, M.D. Community medicine, Branch-XV Degree examination to be held in April 2011.

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INTRODUCTION

The national policy for children 1974 recognizes children as the nation's supremely important asset. It states that it shall be the policy of the state to provide adequate services to children throughout their period of growth and development. Child's health has been given greatest priority over the years and many health programmes have been implemented aimed at reducing child mortality and morbidity [1]

The challenge of the time is to study child's health in relation to community, social values and social policy[2]. The active role of community especially from families is a must. Their role is in turn influenced by the knowledge and perception about the disease and its management.

One of the major health problem encountered in childhood is acute diarrhea. Diarrhea is dangerous because of the dehydration which has been estimated to account for 16% of under-five mortality and 3% of neonatal mortality globally[3]. Diarrheal diseases also cause malnutrition. Children with severe malnutrition and diarrhea have high mortality rate[4]. Studies indicate that diarrhea can also lead to long-term physical impairments such as stunted growth and reduced intellectual development[5]

Globally one in five deaths in children is due to diarrhea. Diarrheal disease occurs worldwide, 90 percent of diarrheal disease deaths in children

under age five occur in developing countries[6]. Africa and South Asia are home to more than 80 percent of child deaths due to diarrhea. Just 15 countries account for almost three quarters of all deaths from diarrhea among children under-five years of age annually. Among this India ranks first [7] .The case fatalities is also high in low resource setting [8]. It also causes heavy economic burden on health services.

The prevalence of diarrhea differs from place to place[9]. The etiology also differs. But regardless of the agent, age or place 90% of diarrheal deaths can be prevented provided little care is taken to see that the child is rehydrated. Diarrheal diseases are like an emergency happening everyday and it is easily preventable and treatable [10].

Awareness of, and access to, existing lifesaving interventions is often limited. In fact, research indicates that only about one-third of children suffering from diarrheal disease in developing countries actually receive the recommended treatment they need[11].

Diarrheal disease doesn't have to be a top killer of children in developing countries. Proven, lifesaving interventions already exist. They include prevention methods such as improved sanitation and hygiene, access to safe drinking water, vaccines, exclusive breastfeeding, and optimal complementary feeding. And, when diarrhea occurs, treatment options such as

oral rehydration solution (ORS)/oral rehydration therapy (ORT) and zinc treatment speed recovery and save lives.

Oral Rehydration Therapy is scientifically sound, practically adoptable, culturally acceptable and economically cheap and is of appropriate technology[12]. Oral rehydration therapy is one of the important medical advances of the 20th century in terms of simplicity and scope to save lives[13]. ORS is the cornerstone of diarrheal disease treatment in both industrialized and developing nations. It reduces dehydration in nearly 90 percent of patients[14] .Since 1970's ORT has saved an estimated 50 million lives[15].

Zinc is a critical new intervention for treating diarrhea, particularly in the developing world. It is a safe and effective treatment option that can considerably reduce the duration and severity of diarrhea episodes, decrease stool output, and lessen the need for hospitalization. It may also prevent future diarrhea for up to three months. It is important that the full course of zinc is taken in conjunction with ORS/ORT and that follow-up and behavior change messages for caregivers are given to ensure full compliance[16].

But over the last decade, momentum has slowed, with declines in research and funding commitments and competing global health priorities. The perceived lack of urgency and taboo nature of the illness may have also contributed to the current low level of awareness surrounding the issue. There have been advocacy challenges as well, because groups have acted in isolation

and failed to exploit opportunities to collaborate across sectors. All of this has contributed to stagnated progress and even declines in intervention coverage in some countries[17].

This is occurring at a time when the World Health Organization has reported that diarrheal disease is the most common illness in the world[18] .Diarrheal disease is not just a health issue, but an economic one as well. In sub-Saharan Africa, for example, treating water-borne diseases like diarrhea costs governments at least 12 percent of their total health budgets each year[19].

Thus the ORT and ORS use has declined in many countries including India. ORS use decline may be due to lack of knowledge about and access to ORT and ORS[20].And also the increased use of intravenous therapy for correction of dehydration. There is also consistent disparity in diarrheal deaths and ORS usage between higher and lowers socioeconomic groups.

In this regard it becomes necessary to assess the existing knowledge of the caregivers in the management of diarrhea with ORT and the various factors which are related to the non usage of the same. In view of this a population based study on ORT among mothers of under- five children was taken up in an urban slum.

OBJECTIVES

1. To assess the knowledge and attitude towards oral rehydration therapy for the management of diarrhea among mothers of under-five children in the slums of Agaram health post, Zone IV of Chennai City.

2. To assess the practices of oral rehydration therapy exercised by these mothers when their child experienced a diarrheal episode.

3. To find the association between the knowledge, attitude and practices with selected demographic variables.

JUSTIFICATION

- This study is relevant because oral rehydration therapy is a major public health intervention
- Diarrhea constitutes 16% of under-five deaths which can be largely prevented by Oral Rehydration Therapy.
- India lags behind in ORT usage when compared to many other countries.
- Though 74% of mothers of in India are aware of ORS, the ORS usage rate is only 29%.
- The state of Tamilnadu has many promising health indicators and has been on the lead in public health. But the ORS usage rate is still low with the knowledge of ORS being 74.1% the ORS-usage rate is only 58.7% in total.
- The reason for not using it has to be identified and the necessary corrective measure has to be planned
- By studying the practice of ORT in-depth the progress of interventions and the impact of control strategies can be judged.

- The extreme crowding conditions, lack of proper sanitation and drinking water facility exposes the slum dwellers to a high risk of diarrheal disease.

- Lack of community studies on the knowledge of zinc supplementation in Tamilnadu.

- Lack of community based studies on the knowledge, attitude and practices of slum dwellers on diarrhea management with ORT.

REVIEW OF LITERATURE

It is still unbelievable that diarrhea is one of the leading causes of childhood death in the world[21]. Every year 9.2 million children under five years of age die and 90% of these are from preventable conditions as diarrhea[22]. Diarrhea kills more young children around the world than malaria, AIDS and TB combined[23]. As our world climate and demographics change diarrheal disease will become an even more significant global health threat. According to the International Federation of Red Cross approximately 60% of the request for emergency funding was related to acute diarrheal disease [24].

THE DISEASE -DIARRHEA

The WHO defines diarrhea as the passage of three or more loose or liquid stools per day, or more frequently than is normal for an individual. However it is the recent change in consistency and character that is more important. Passage of even one large stool constitutes diarrhea[1]. It is caused by bacterial, viral, and parasitic organisms and is usually a symptom of gastrointestinal infection. Diarrhea is life-threatening because it leads to fluid loss and can cause severe dehydration. Infants who are not exclusively breastfed, young children, and adults who are malnourished are at greatest risk[25].

There are three major diarrhea syndromes:

- Acute watery diarrhea-the most common form that most likely leads to rapid dehydration. It last for 10-14 days. This form is the most deadly in young children.

- Persistent diarrhea, a less common form and last beyond 14 days. It is disproportionally associated with an increased risk of death.

- Bloody diarrhea is often related to malnutrition, intestinal damage, and secondary sepsis. It is often associated with dysentery[25].

Diarrhea has both short-term and long-lasting effects, ranging from severe dehydration to malnutrition, which in turn can weaken its victims' immune systems and make them more susceptible to future diarrhea episodes as well as other illnesses.

IT'S GLOBAL BURDEN

Diarrheal diseases continue to be a leading cause of morbidity and mortality in the world today. The WHO estimates about the mortality and burden of the disease shows that 2.169 million deaths and 72.73 million DALY lost due to diarrhea[18]. The actual incidence may be manifold.

Diarrhea remains the second leading cause of death among children under five globally. Diarrhea causes dehydration. Children are more likely than adults to die from diarrhea because they become dehydrated more quickly. Diarrhea is also a major cause of child malnutrition. Nearly one in five child deaths – about 1.5 million each year is due to diarrhea. More than half of these cases are in Africa and South Asia[26].

IT'S MANAGEMENT -ORAL REHYDRATION THERAPY

More proven interventions are available to prevent and treat diarrheal diseases than any other major child killer[27]. The persisting high mortality from diarrheal disease in the presence of existing cost-effective interventions and available resources to implement them represents a continuing scandal. Reducing these deaths depends largely on delivering life saving treatment that includes

1. Fluid and electrolyte replacement to prevent dehydration- ORS or use of appropriate fluids available in the home if ORS is not available,

2. Zinc treatment

3. Continued feeding including breast milk and along with increase fluids in general[28].

Previously it could only be treated by qualified nurses or doctors using expensive intravenous infusion in an often inaccessible hospital. With the discovery of ORT, it can be treated by a mother giving her child the right mix of sugar, salt and water in her own home.

In the 1970 and 1980's the international community committed itself in this regard by scaling up the use of ORT coupled with programmes to educate caregivers on its appropriate use. The effort met with great success. **The UNICEF committed itself to make a major global push to achieve 80% ORS use rate by 1995**[29].

EVOLUTION OF ORT

In the early 1980s it was felt that all diarrhea episodes should be treated with a solution of oral rehydration salts. Although WHO continued to recommend ORS packets for all cases of diarrhea, it was recognized that access to ORS was limited. Furthermore, 60–70% of cases of diarrhea was not accompanied by dehydration and therefore did not require ORS. The emphasis therefore shifted to preventing dehydration by means of recommended home fluids (RHFs), an approach that gained popularity in the 1980s. Different countries have different guidelines on what constitutes a recommended homemade fluid. Such fluids can be prepared at home using readily available and low-cost ingredients. Examples of rehydrating fluids include cereal-based drinks made from a thin gruel of rice, maize, potato or other readily available low-cost grain or root crop the family has at home. Breast milk is also excellent for fluid replacement and should continue to be given to infants with diarrhea simultaneously with other oral rehydration solutions.

In 1988, continued feeding was added as one of the indicators of appropriate management. In 1990–91, emphasis shifted to the amount of fluid given rather than the type of fluid, and the indicators were modified accordingly. The expression ‘‘ORT (increased fluids)’’ was introduced. From 1993 onwards **increased fluids plus continued feeding constitute ORT**.

In 2001, a new ORS with a reduced sodium and glucose content was created. The new formula, low- osmolarity ORS (245 m mol/ litre) is packaged as a powder to be mixed with clean water. It is easy to use and can be administered by a health care provider or **at home by parents and caregivers**. Compared with the original formula, the new formula improves efficacy and reduces the need for unscheduled interventions by almost 33 percent, lowers stool volume by nearly 25 percent, and causes almost 30 percent less vomiting[30]. The WHO and UNICEF both recommend use of the low-osmolarity formula[31].

The formula for ORS recommended by WHO and UNICEF contains

Reduced osmolarity ORS	**gms / litre**	**Reduced osmolarity ORS**	**mmol / litre**
Sodium chloride	2.6	Sodium	75
Glucose, anhydrous	13.5	Chloride	65
Potassium chloride	1.5	Glucose, anhydrous	75
Trisodium citrate, dihydrate	2.9	Potassium	20
		Citrate	10

Oral rehydration takes advantage of glucose-coupled sodium transport, Glucose enhances sodium, and secondarily, water transport across the mucosa of the upper intestine. Thus the fluid and electrolytes lost in the stool is replaced effectively.

ORT and ORS were critical in preventing more than one million diarrheal disease deaths annually by the 1990s. But these efforts lost momentum as the attention shifted to other diseases and some considered the issue solved due to the drastic reduction in the mortality. A 2008 research study by PATH found that diarrheal disease ranked last among a list of global health priorities. Only 4.4% of global health funding goes towards diarrheal diseases[32]. And today only 39% of children with diarrheal disease in the developing countries receive ORT.A figure that has changed very little since 2000[33]. Less than one quarter (22 per cent) of children with diarrhea in developing countries drink more fluids of any type during their illness

Nearly one third of children with diarrhea in developing countries receive either much less food or none at all during their illness – placing far too many children at risk of worsening nutritional status.

Barriers exist at both global and country level with lack of awareness and access to life saving interventions. From 1992-2005 ORS use has declined in 23 countries of which 14 are in African region. This may be due to lack of knowledge about ORS and inadequate access to it[34]. An urgent need for health

education –many of these deaths can be avoided if parents and caregivers understand what to do when illness strike. Everyone has the right to know this information.

CURRENT COMMITMENTS

World leaders at the United Nations Millennium summit in 2000 agreed on a critical goal to reduce deaths of under five children by two thirds by 2015- MDG 4 (The Millennium Development Goal) [35]. Fighting diarrheal deaths can spur the progress towards achieving this target.

By increasing the awareness about ORT, making live saving interventions and improving the sanitation -widely available to everyone and **working to reestablish diarrheal diseases as a global health priority we can save millions of children lives.** Leaders in the global health community have expressed a need to add diarrheal diseases as a health priority[36].

INDIAN SCENARIO

India ranks first among the 11 countries of global deaths related to diarrhea, out of which 90% occur in children[37]. According to UNICEF Report- state of world's children 2009 the under five mortality rate is 72 per 1000 live births in India and it holds the 49th rank among the world countries[38] . In 2008 it was 69 per 1000 live births Out of this 17% of deaths are due to diarrhea. In health institutions up to a third of total pediatric admissions are due to diarrheal

diseases. Diarrheal diseases become fatal when it leads to dehydration. If dehydration can be treated effectively by proved interventions these deaths can be prevented.

The diarrheal diseases control programme was started in India in 1981 with the objective of reducing mortality and morbidity due to diarrheal diseases through the effective introduction of oral rehydration therapy. With the inception of National Oral Rehydration Therapy Programme since 1985-86 the focus of activities has been on strengthening case management and **improving maternal knowledge related to use of home available fluids, use of ORS and continued feeding[39].** The incidence of diarrhea has not changed, but the overall mortality has declined. In 2004 with the introduction of low osmolarity ORS, Government of India under its Reproductive and Child Health Programme especially emphasized upon improving child survival activities including **enhancing the ORS use rate through appropriate Behavioral change Communication and making new ORS widely and easily available at home, communities and health centers/ facilities[40]**. Rapid and easy access to ORS and knowledge about its use are crucial to the reduction of deaths and severity due to diarrhea.

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However in the recent years the focus has been shifted to other diseases such as HIV/AIDS. Even after years of ORT knowledge and promotion of availability of ORS through primary health care the progress is not significant.

The National Family Health Survey of India's assessment of the case management of diarrheal diseases with ORS use rate [The NFHS-3 2005-2006] data shows that only 26.2% of children under the age of three years who had diarrhea in the past two weeks of survey received ORS[41]. The NFHS -2 data [1998-1999] shows an ORS use rate of 26.9% [42]. **The ORS usage rate has in fact decreased by 0.7 %.**

The UNICEF database shows the proportion of children (0-59 months) with diarrhea in the last two weeks of survey who received ORT is only 33% in India. This is very low when compared to other Asian countries which also have a higher diarrheal incidence. The ORS use rates among some Asian countries are as follows[43]

Table: 1 List of selected countries with ORS use rate

COUNTRY	ORS USE RATE IN %
Afghanistan	48
Bangladesh	49
Indonesia	56
Myanmar	65
Philippines	76
Srilanka	62
India	33

This clearly shows a deficit in the case management attitude of diarrhea with ORT particularly among the caregivers in India.

In the state of Tamilnadu the usage rate has been 29% in NFHS-III [2005-2006] and in NFHS-II it was 27.7%. The usage rate has increased by only 1.3% in this seven years period. This is very low when compared to other states of India. The percentages of mothers who know about ORS in the various states is that 90-95 % of mothers in Delhi and Mizoram know about *ORS, while one third of women in Rajasthan and Jharkhand do not know ORS.*

There is also a consistent disparity in diarrheal death rate and ORS usage between higher and lower socioeconomic groups. Deaths from diarrheal diseases disproportionately target the poor due to

- Poor environmental sanitation
- Inadequate water supply
- Poverty
- Limited education.

To address this disparity it becomes necessary to know the status of caregivers with regard to the knowledge and perception towards ORT.

Another novel intervention in the management of diarrhea is the introduction of zinc. It has been proved that zinc treatment results in 25% reduction in the duration of diarrheal diseases and 29% reduction in the treatment failure and severity of the disease. It also decreases the stool output and the need for hospitalization. It may also prevent the future incidence of diarrhea[16]. As on May 2009 India has the National policy on the use of zinc for diarrheal treatment.

A few countries have recently taken steps to make zinc and low-osmolarity ORS more widely available. In Nepal, government has approved and accepted the zinc policy. In Benin, the Ministry of Health and UNICEF are working closely to introduce a diarrhea treatment kit – containing both ORS and zinc tablets through the public health system in areas with the highest diarrhea prevalence rates.

Disparity in the knowledge on ORT has been universal. A study conducted in London in 2008 reveals that 74% of pediatric health facilities in London are unaware of ORT use as an intervention[44].

A study conducted in Burundi (2007) among caregivers on the influence of intensive strategies of heath education in the case management of diarrhea

found that caregivers exposed to mass campaigns showed significant increase in the knowledge of signs of diarrhea , dehydration and self efficacy for ORS use. 86% of exposed caregivers discussed ORS use with others[45]

A study conducted in Egypt under NCDDP found that by increasing the availability of ORS, the training of health workers and education of general public the ORS use rates were doubled and most mothers were able to mix ORS Solution correctly. There were also positive changes in feeding during and after the diarrhea episode[46.]

A study in Thailand by Varavitya W. et al shows that though 50.7% of diarrheal diseases among under -five children were managed by the mothers, the accuracy of dilution was only 31.8% among them[47].

An operational study (1991) conducted in West Bengal, India on the implementation of ORT in rural communities concluded that the major obstacle for ORS use were lack of motivation and the inability of health care providers to maintain a sustained skill level[48].

A case control study conducted in the pediatric department in Thiruvananthapuram, Kerala, on the influence of parental education shows that education of caregivers had a strong relation in preventing dehydration. The awareness of ORS was only 29% in cases while it was 85% in controls[49].

A study conducted in Delhi by Shibani Bandyopadhgay to assess the preparation of ORS solution among mothers found that only 10.8% of mothers correctly prepared the solution and recommends that communication methods should be stepped up[50].

Another study conducted in Rajasthan by Dr. S K Jain et al shows that about 30% ADD cases were given ORS, but most of the care givers were unable to demonstrate the correct method of preparation. The study also demonstrated a nearly twofold higher incidence of ADD in infants (13%). It recommends a need to increase the efforts to bring awareness of ADD and ARI among the population and to change the health seeking- behavior of the community, on a priority basis[51].

Another study conducted in the state of Maharashtra, India shows that 42% of mothers there still believe that a child with diarrheal disease should receive less fluid and less food than normal. The message on ORT has reached about 65% of the mothers without the basic education of the meaning of that message. It has also lost its effect substantially[52].

Analysis of NFHS -2 data on the effects of exposure to mass media by K.V.Rao et al indicates that mother's exposure to electronic mass media increased the awareness and use of ORT. In rural areas group educational activities had positive effects on the knowledge and use of ORS and home available fluids. It also showed the discrimination against girls in the use of ORS packets and decreased awareness even among health care providers[53].

A study conducted by Harmeet Singh Rehan et al in Nepal on KAP of mothers regarding diarrhea and its magnitude shows that home care practices of mothers that 42.4% mothers gave usual amount of food, water and or breastfeeding. 41.8% have reduced or stopped and 15.7% gave increased to children[54].

In a study conducted in Haryana, India by Mazum der.s et al concluded that educating caregivers in zinc supplementation and providing zinc to infants less than 6 months can reduce diarrhea[55].

Another case control study by Bhandari et al among slum children in Delhi shows that Zinc supplementation substantially reduced the incidence of severe and prolonged diarrhea, the 2 important determinants of diarrhea-related mortality and malnutrition.

The scientific rationale for ORT, and for continued feeding during diarrhea, has been established beyond doubt. But the real practice of ORT has shockingly reduced in spite of the fact that diarrhea still continues to kill children. It is the right time to act .The cause for this decline has to be analyzed and necessary actions have to be implemented. The challenge now is to place that knowledge in the hands of parents so that they themselves can protect their children against the dehydration and malnutrition caused by childhood's most common disease

METHODS AND MATERIALS

Study design: Community based cross sectional study.

Study area: This study was done in the slums of Agaram health post.

Zone IV of Chennai.

Study period: This study was done between May 2010 to October 2010.

Study population: Mothers who had children under the age of five living in the study area.

Inclusion criteria:

Willful mothers of under- five children who are permanent residents of the slum, as enrolled in the family register.

Exclusion criteria:

1. Mothers of under- five children who are not permanent residents.
2. Mothers of children who are above five years of age.
3. Mothers who could not be contacted even after 3 visits.

Sample size:

As per **NFHS-3 (2005-2006) d**ata the prevalence of knowledge on Oral Rehydration Therapy among mothers is 74.1% in Tamilnadu and it is

considered for calculation of sample size at 95% CI (Z=1.96) and the limit of accuracy is kept at 6% of 74.1%.

$$\mathbf{N} = \frac{z^2\, pq}{D^2}$$

$$\mathbf{N} = \frac{(1.96)^2 \times 74.1 \times 25.9}{4.4 \times 4.4}$$

$$= 380.60$$

[P = 74.1, q = 25.9 , D = 4.4, z = 1.96]

The sample size for this study was rounded of to 400 informants.

Sampling procedure:

The study was done in Chennai corporation area limits. Due to logistics reason Zone IV was selected. Among the 11 divisions in the Zone IV, two divisions [Agaram- North and Agaram- South] were selected randomly by lottery method. There were 18 and 14 slums in Agaram North and south respectively. List of all mothers who have children under the age of five living in the slums of the above two divisions were obtained from the family register. There were 958 mothers in the slums of Agaram North and 722 mothers in the slums of Agaram South- totally 1680 mothers at the time of study. These 1680 mothers constitute the sampling frame.

Population Proportionate sample to be drawn from

1. Agaram north - $\frac{400}{1680}$ x 958 = 228

2. Agaram south - $\frac{400}{1680}$ x 722 = 171.9 approximated to 172

Continuous numbers were assigned to the list of mothers in each division. Keeping a 10% non response rate (400 + 40), the requisite number of mothers were selected from each division (251 and 189 respectively)using table of random numbers and interviewed until the required sample size of 400 (228 and 172) was attained.

Research instrument:

This study made use of a semi structured questionnaire and demonstration of the procedure as a method of data collection. The questionnaire was adapted from the survey questionnaire used in NFHS-3 and from similar questionnaires employed in other surveys and investigations such as DHS survey and adapted to the local social and cultural norms and values and beliefs. It was prepared both in English and local language (Tamil).This questionnaire was modified after discussion with our professors. The questionnaire was pre tested in the local language and based on the observations made necessary changes were made in the questionnaire.

The developed questionnaire has 3 parts. **Part 1** consists of details on the socio demographic profile of the respondents such as age, number of children under five years of age, breast feeding practice, income, literacy etc. **Part 2** consists of questions related to diarrheal episode in their children, their health seeking behavior, knowledge and attitude on ORT.

To assess the prevalence of ORT knowledge that existed in the study area scoring was given as per the instructions from the guide .ORT knowledge was determined by a score of 9 (range 0–9) based on answers given to 9 selected questions chosen before the start of the study based on their importance in ORT, with one point awarded for each correct answer and zero scoring for a wrong answer. Those with score between 0-3 were considered of having poor knowledge, those with a score of 4-6 were considered to have some knowledge and a score of 7-9 was considered of having good knowledge about ORT.

The demonstration was observed and scores were given as 1 for the correct task. A score of 2 was considered as correct procedure and other scores (0, 1) were considered as incorrect procedure. The Knowledge and demonstration scores are given in the annexure. **Part 3** consists of questions related to the actual practice of ORT exercised by the mothers during the diarrheal episode of their child.

Data collection

Data collection was started after obtaining permission from the director, Institute of Community Medicine, the DEAN, Madras Medical College, Institutional Ethical Committee, and The Commissioner, Corporation of Chennai and Health officer- Corporation of Chennai.

Data collection was done by house-to-house visit. With the help of the concerned MPHW –Female, the mothers were approached. When a respondent could not be contacted on the first visit, she was revisited at the next possible time and interviewed. After a brief introduction and obtaining their informed verbal consent, relevant information were obtained from the willful respondent using the pretested semi structured questionnaire in the local language (Tamil) and the questionnaire filled on the spot. The respondents were then made to demonstrate the preparation of ORS solution from the ORS Packet provided to them by the investigator. At the end, any misconception or queries on ORT were clarified and the correct method of preparation demonstrated if it happened to be incorrect.

Data analysis

Data was spread in excel sheet and analysis was done using SPSS package. The entered data was cleaned and validated for consistency. Prevalence was expressed in percentage. For comparison among categorical variables Chi-square test was used. A p value of < 0.05 was considered to be significant.

OPERATIONAL DEFINITIONS

Diarrhea

Diarrhea is the passage of three or more loose or liquid stools per day, or more frequently than is normal for an individual. However it is the recent change in consistency and character that is more important. Passage of even one large stool constitutes diarrhea.

Oral rehydration therapy (ORT)

ORT is an increase in administered fluids and continued feeding to treat dehydration. The fluids consist of a solution of salts and sugars in proper amounts which are taken by mouth.

Oral Rehydration Solution (ORS)

A liquid preparation developed by the World Health Organization that can decrease fluid loss in persons with diarrhea.

Recommended Home Available Fluids (HAF)

If ORS is not available a set of homemade fluids are effective in preventing dehydration.

Different countries have different policies on what constitutes it. Commonly used recommended HAF include rice water or kanji, dhal water with salt, butter milk or curd with salt. Other fluids include correctly

constituted sugar salt solution, lemon water, vegetable soups. Plain water when given along with food is a good HAF. Soft drinks, sweetened fruit juices and sweetened tea should not be used. Breast feeding has to be continued.

Under-five child

Under five child were "those who did not reach his//her fifth birthday on the date of preparing the sampling frame.

Under Five Mortality Rate

It is defined as the annual number of deaths of children aged less than five years in a given year to the total number of live births in the same year, expressed as a rate per 1000 live births.

Slum

A compact area of at least 300 populations or about 60-70 households of poorly built congested tenements, in unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities

House wives

Women involved only in household work and not engaged in any commercial work.

ORS usage rate

Proportion of children aged 0-59 months with diarrhea receiving oral rehydration salts during the diarrhea episode.

Increased fluids

Proportion of children aged 0-59 months with diarrhea receiving more to drink during the diarrhea episode.

Continued feeding

Proportion of children aged 0-59 months with diarrhea receiving more, about the same or somewhat less food during the diarrhea episode.

RESULTS

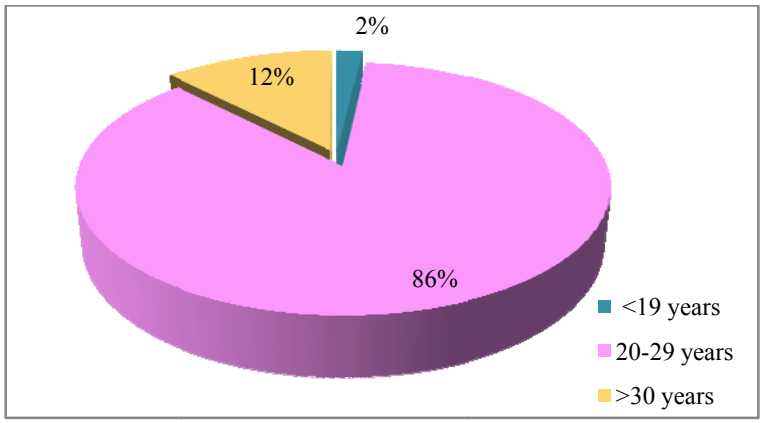
This study was conducted in the slums of the two divisions of zone IV of Chennai Corporation, which were randomly selected by lottery method. 400 mothers of under-five children participated in the study. The study estimated the prevalence of ORT knowledge and the correct practices of the same among these mothers and assessed the association between knowledge, attitude and practice and various demographic factors such as age, education status, parity, socioeconomic status. The ORS use rate among the children under five years of age who had diarrhea in the previous two weeks of survey was also estimated. The factors associated with the non-usage of the same were also assessed.

SOCIO DEMOGRAPHIC PROFILE OF THE STUDY POPULATION

Age of respondents

The age of the respondents ranged between 19 to 37 years. The mean age was 25years. Among the study group 85.9 % of them were in the age group of 20-29 years. 1.8 % was less than 19 years and 12.3% were more than 30 years of age.

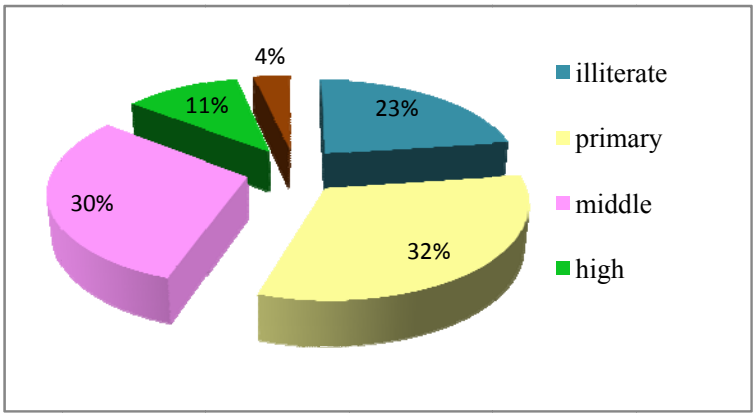
Figure: 1 Age distribution



Educational status

Among the study group, 77.2% were literate and 22.8% were illiterate. Majority of the literates in the study group had primary and middle school education.

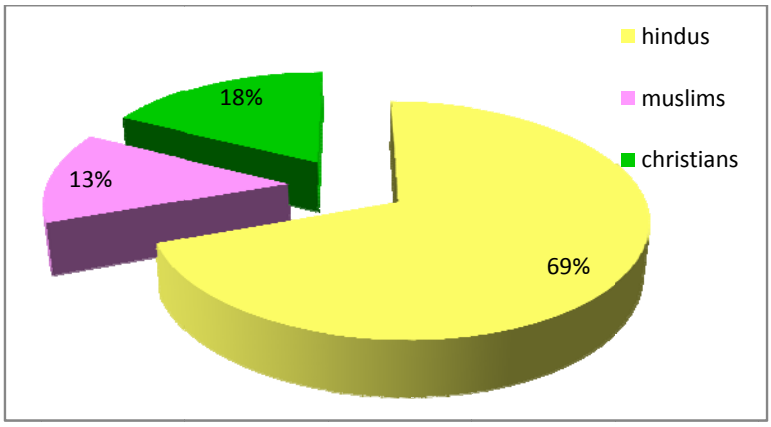
Figure: 2 Educational status



Religion

Among the study group 69.7 % were Hindus, 12.8 % were Muslims and 17.5 % were Christians

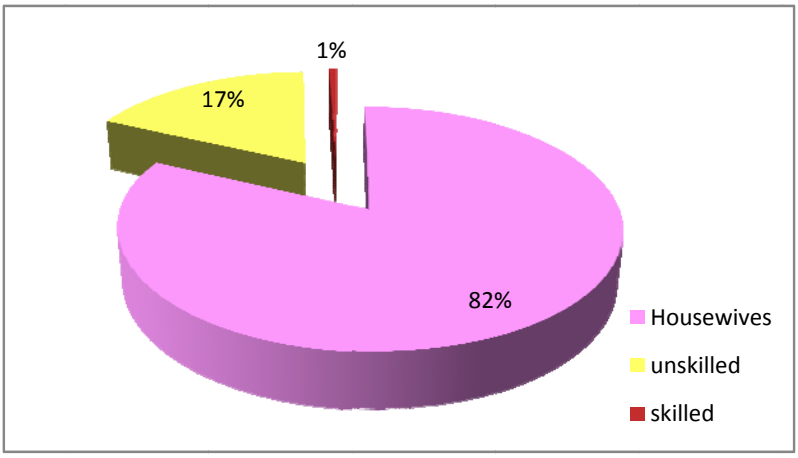
Figure: 3 Distribution by religion



Occupation

Among the study group, 82 % were house wives, 17.5 % were unskilled workers and 0.5 % was skilled workers.

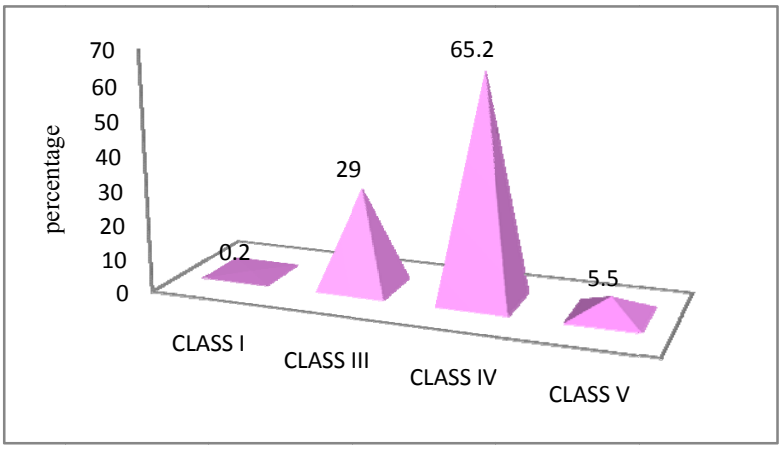
Figure: 4 Distribution by occupation



Socioeconomic status

Among the study group, 0.2 % belonged to Upper socioeconomic status, 29 % belonged to the lower middle class, 65.2 % belonged to the upper lower class and 5.5% belonged to lower socioeconomic class.

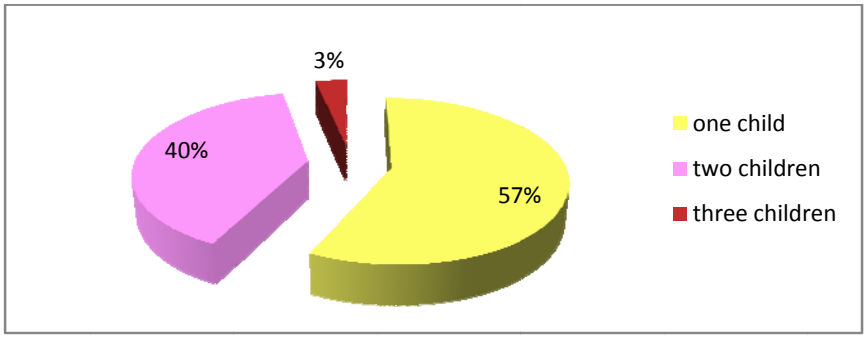
Figure: 5 socioeconomic status



Reproductive status

Among the study group 57 % of mothers had one under-five child and 40 % of mothers had two under-five children and 3 % had three under-five children.

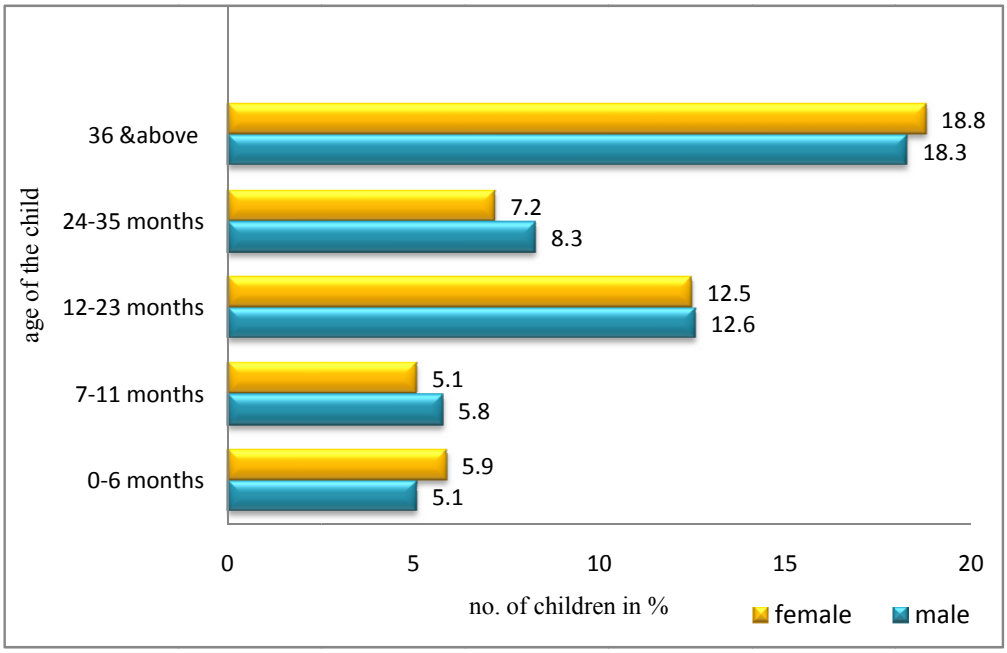
Figure: 6 Frequency of under-five children per mother



Details of the under-five children of the respondents

The total number of children under-five years of age bore by the study group was 584. Among this 294 were male children and 290 female children. Among this there were 75 children under 6 months of age and 64 children between 7-11 months. Maximum children were in the 12-23age group. Totally 122 mothers breast fed their children and 32 mothers exclusively breast fed their child.

Figure: 7 Age and sex-wise distribution of the under-5 children



Prevalence of diarrhea among the under-five children.

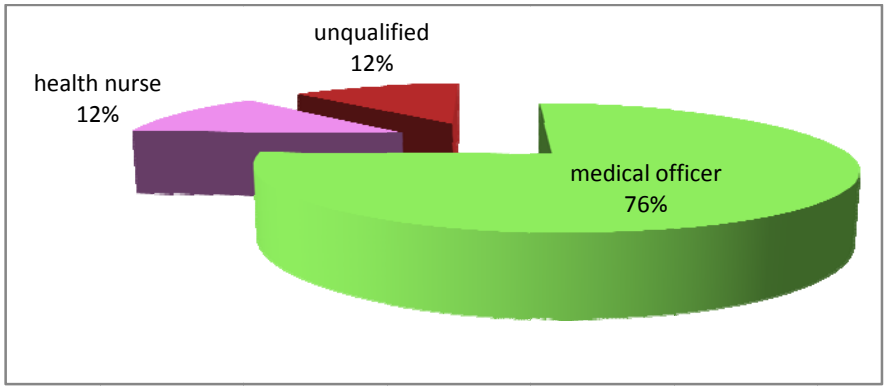
Among the study group 371 mothers (92.8%) reported that their child had diarrhea at some point of time. Among this, diarrhea was reported to have occurred in their under-five child in the previous two weeks of survey by 111 respondents (29.9%) and in others (70.1%) it had occurred prior to the previous two weeks. The mothers were enquired about the details of the children who suffered from diarrhea in the previous two weeks. The response was one child per mother. Thus the **Prevalence of diarrhea in the under-five children of the study group was 19 %.** Maximum prevalence had occurred in the 7-11 months age group.

Health seeking behavior of the respondents

Among the study group (400) 93.2% of mothers perceive that diarrhea will affect the child's health, **2.8% of mothers still think it is harmless** and 4% does not know the effects. Among the study group 19.5% of mothers still believe that diarrhea can be managed only in the hospital. Only 78.8% believe that it can be managed at home

Among the mothers whose child had diarrhea at some point of time (371) 89.2% of mothers sought treatment while 10.8% handled it themselves. Majority of these respondents (75.5%) sought treatment from medical officers that includes both Government and private sectors while urban health nurse was sought by 12.3%. 12.2 % had contacted neighbors and unqualified persons. **Anganwadi workers were never contacted.**

Figure: 8 Place of seeking treatment



Knowledge on Oral Rehydration Therapy

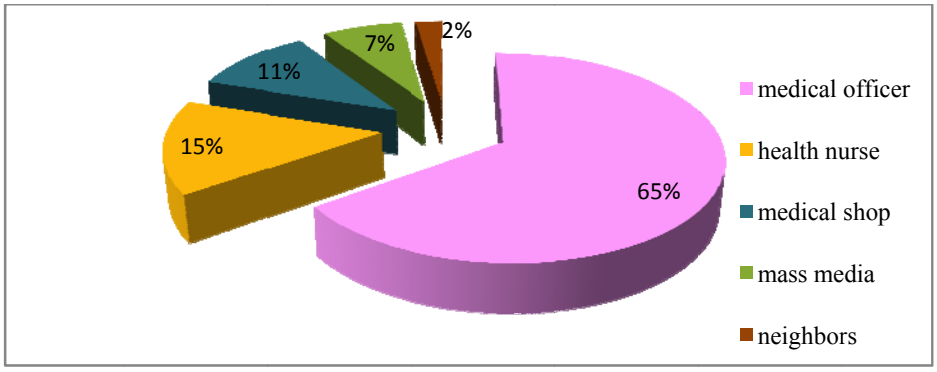
Among the mothers whose child experienced diarrhea (371) 74.5% of mothers were aware of ORS and still 25.5% of mothers were not aware of the use of ORS in diarrhea management.

Table: 2 Awareness on ORS.

Awareness	Frequency (n =400)	Percentage (%)
Yes	298	74.5
No	102	25.5

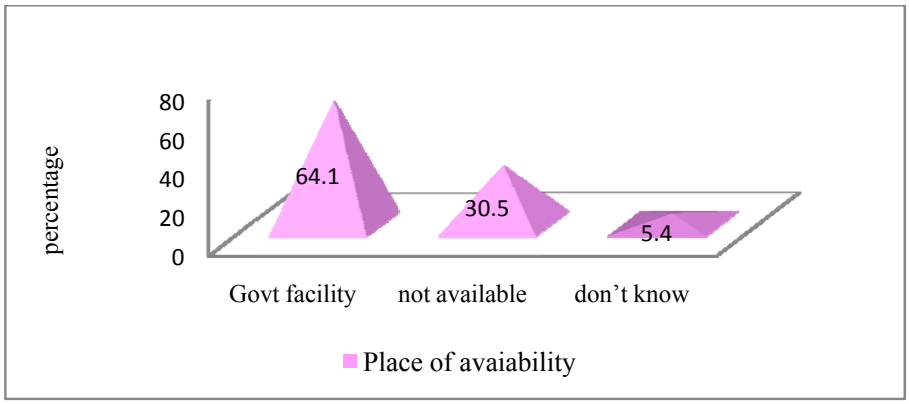
Among these 74.5% of mother's, 65.1% were aware of ORS through medical officers, 14.8% from health nurse, 10.7 % through over the counter medication, and 2.3% through neighbors. **Only 7% were aware through mass media. There was no participation from Anganwadi workers.**

Figure: 9 Source of knowledge on ORS



Among the 298 mothers who were aware of ORS only 64.1% of the mothers who were aware of ORS knew that it was available free of cost in Government sector. Only 91.3 % (272) said that they knew the method of preparation of the solution. Among them 72.8 % knew the method of preparation as heard from the source of information and 27.2 % learnt it by reading the instruction in the sachet. There had been no demonstration in any occasion.

Figure: 10 knowledge on the place of availability of ORS



Among the mothers who knew that fluids should be given (375), majority (59.4%) did not know the role of ORS/ HAF in diarrheal management. Only 40.6% knew that it was administered for the correction of dehydration. **No mother was aware of zinc supplementation in diarrhea management.**

Figure: 11 knowledge of preparation of ORS

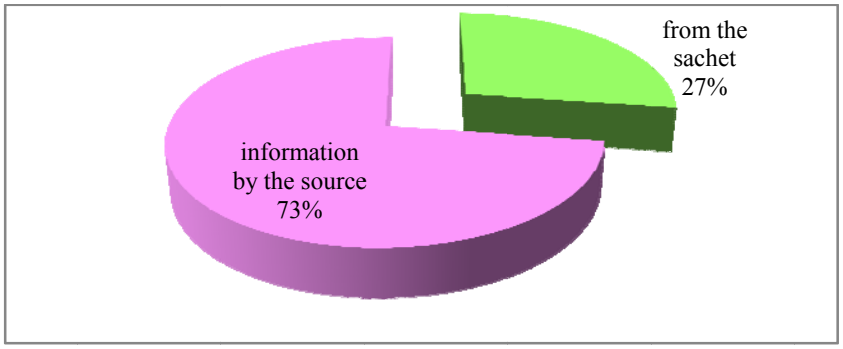
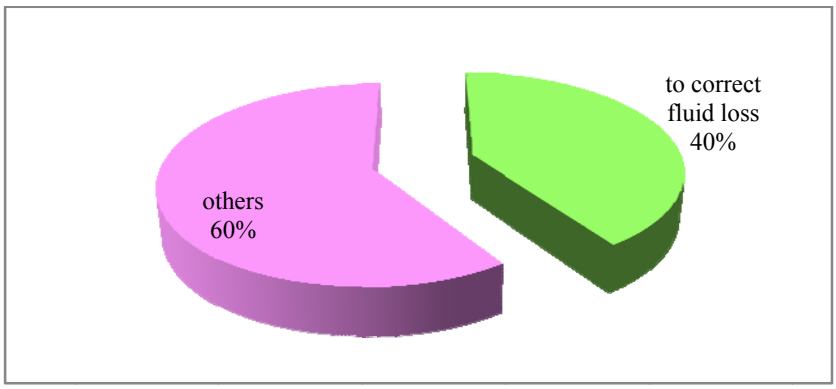


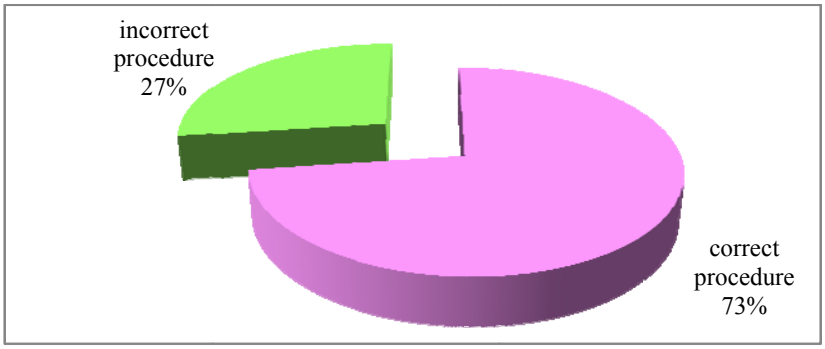
Figure: 12 knowledge on the role of ORS/HAF in diarrhea



With reference to the preparation ORS solution from the ORS packet provided among the 272 respondents, only 72.8 % demonstrated the correct procedure. 27.2% of them did not demonstrate the correct reconstitution. It was either using inaccurate volume (1 liter) of water or not using the full sachet.

Hand washing before preparation was practiced only by 42.3 % of them in total.

Figure: 13 Demonstration of ORS preparation

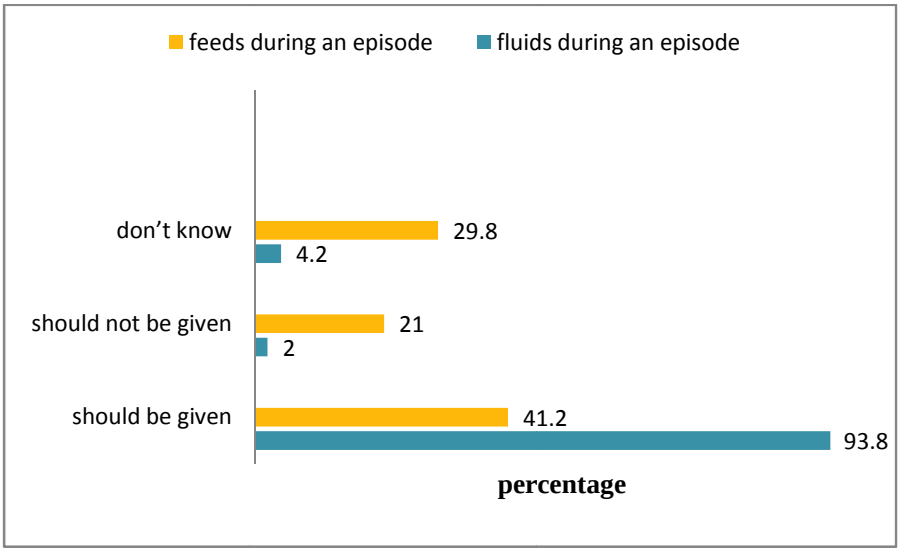


Attitude towards giving fluids and feeds.

Among the 400 mothers 6.2% still believe that fluids should be restricted during the diarrheal episode. Only 93.8% knew that fluids should be given. Among the 298 mothers who knew of ORS, only 92.2 % (275) had the desire to give ORS. 7.8 % of mothers believed that a powder cannot manage diarrhea.

Among the 400 mothers only 49% believed that feeds should be continued during the diarrheal episode while 21.2 % of mothers strongly believed that foods should not be given during the episode. 29.8 % of mothers did not know what should be done. Totally 61% of respondents did not have the correct knowledge on continuing feeds.

Figure: 14 Attitude towards fluids and feeds.



KNOWLEDGE SCORE

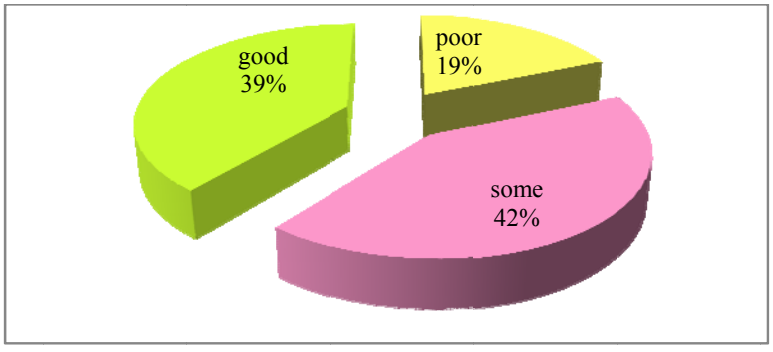
Accordingly the knowledge score for increased fluids preferably ORS / recommended HAF with continued feeds were

39.1% of mothers had good knowledge on ORT

42.3% of mothers had some knowledge on ORT

18.6% of mothers had poor knowledge on ORT

Figure: 15 Prevalence of knowledge on ORT



Practice of oral rehydration therapy.

ORS / HAF usage

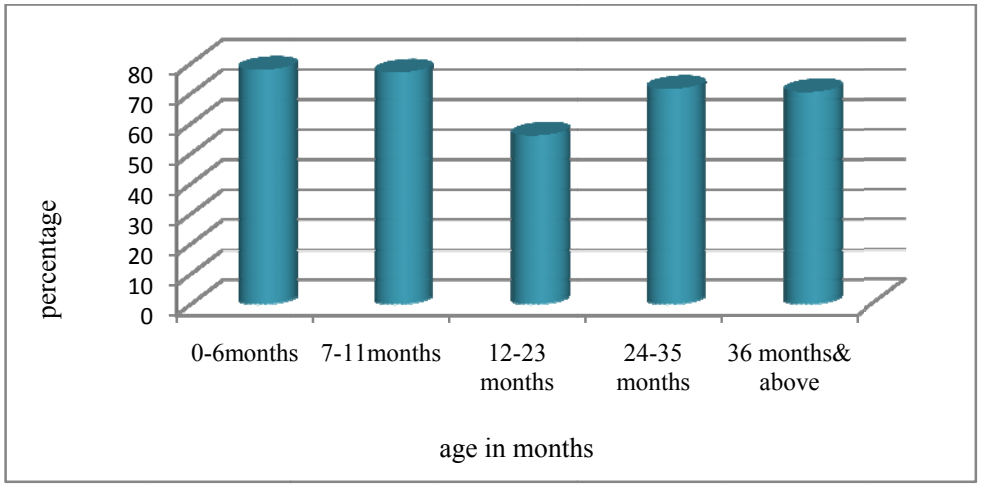
Among the 275 mothers who had the positive attitude towards ORS administration 14 mothers did not have the chance to administer it since there was no diarrheal episode in their child.

Among the 261mothers, only 191 mothers (73.1%) actually gave it to their child when the child had diarrhea at some point of time.

70 mothers (26.9%) did not use it in spite of being aware of ORS.

Among the 111 children who experienced diarrhea in the past two weeks ORS was used in 68.4 % of children**.**

FIGURE: 16 Age wise ORS use rate



Preservation and administration practices

Among the 191 mothers who gave ORS to their children, 77.5 % kept the prepared solution for 24 hours. And 98.4 % of them kept it in the room temperature and only 80.1% of mothers practiced fluid administration after the passage of every stool. The correct amount of fluid was administered only by 33 % of mothers. 4.2% of mothers had used feeding bottles for solution administration.10.5% had heated the prepared ORS solution. In case of vomiting 12.6 % of mothers had stopped ORS administration

Practice of fluids and continuing feeds

Among the 371 mothers of under-5 children who had diarrhea at some time **11 children were under exclusive breast feeding** and they were excluded**.**

Among the 360 mothers 99.5 % gave HAF. Out of this only 81.6 % gave recommended HAF. Rice water, dhal water, weak tea, arrow root kanji were the common HAF given. **Increased fluids were practiced only by 3%.** 34. 8% gave less than usual.

And 71.3 % of mothers fed their child either with the same amount, somewhat less than the usual amount or more than the usual amount of feeds and **only 0.9% gave more feeds**. Among the 277 mothers who fed the child, 91 % of mothers fed their child with soft cooked foods. And only 13.8 % of

mothers actually fed the child with increased frequency. Among the breastfeeding mothers only 73.4 % continued the same while 26.6% gave up breast feeding.

Figure: 17 Preservation and administration practices

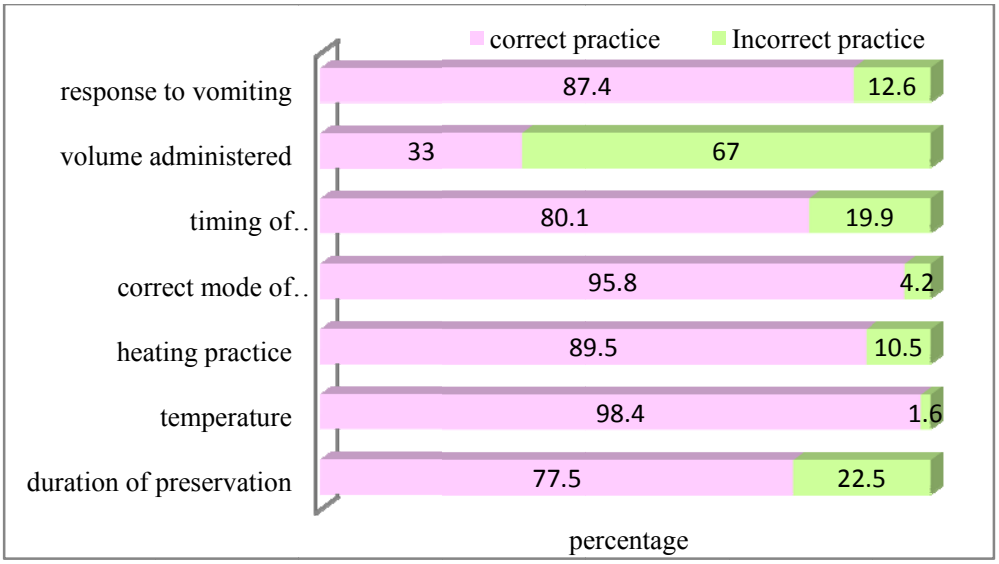
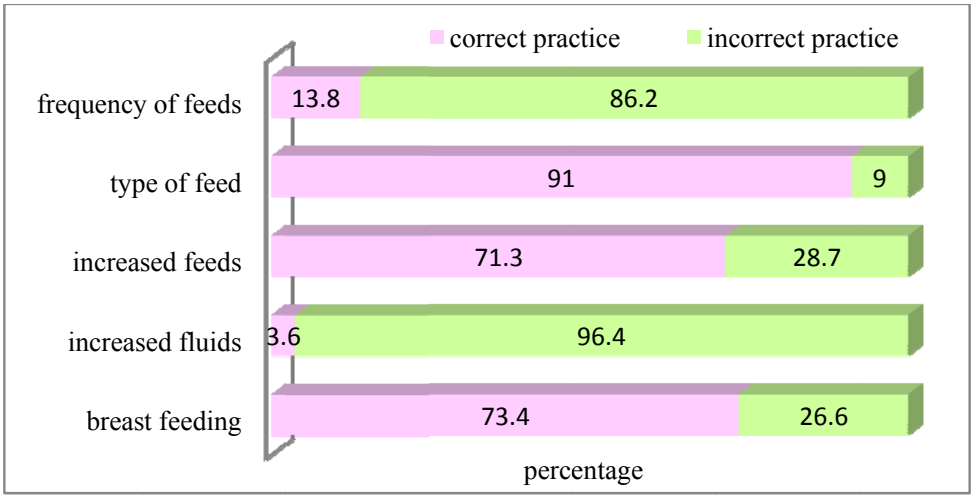


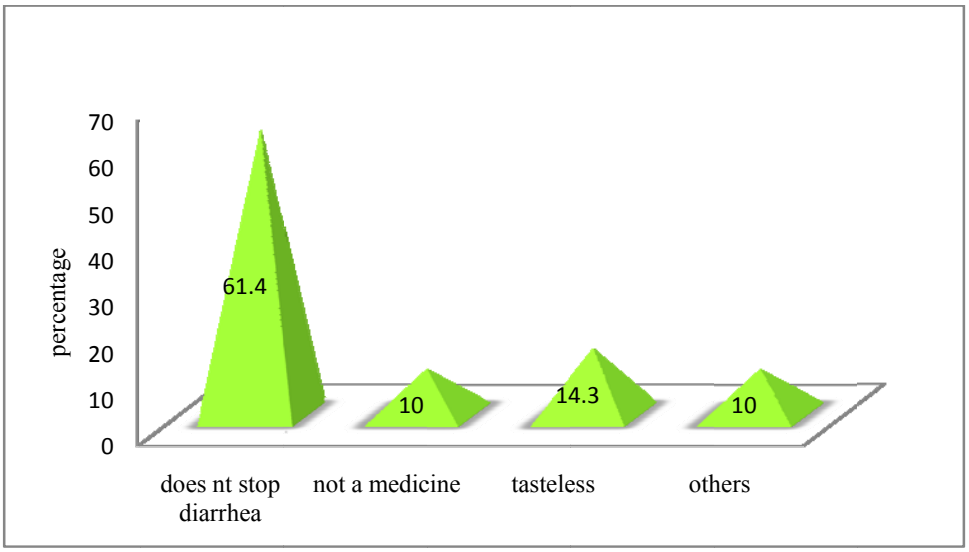
Figure: 18 Practice on continued fluid and feeds



Reasons for non usage of ORS

70 (26.9%) mothers did not use ORS during the diarrheal episode of their children even after knowing it. Majority of them (61.4%) did not use it because they believe that ORS does not stop diarrhea. 10% consider that a powder cannot be a corrective medicine to stop diarrhea.14.3% didn't use it as it was tasteless. Others (10%) include reasons as it causes vomiting, costly and lack of knowledge on the preparation.

Figure: 19 Reasons for non-usage of ORS



Education of the mother and knowledge on ORT

The mothers with middle and higher schooling have better knowledge on ORT than illiterates and those with primary education and it is statistically highly significant (Table: 3)

Table: 3 Education of mother and the knowledge on ORT

Education of the mother	Knowledge on ORT			Total
	Poor	Some	Good	371
Illiterate	22 (25.3%)	48 (55.2%)	17(19.5%)	87
Primary	36 (30.5 %)	53 (44.9%)	29 (24.6%)	118
Middle	10 (9 %)	44 (39.6%)	57 (51.4%)	111
High school & above	1 (1.8 %)	12 (21.8%)	42 (76.4%)	55

$X^2 = 72.831$ $p = <0.001$ $df = 6$

Education of the mother and the practice of ORT.

The educated mothers use ORS more than illiterates and it is statistically highly significant (p=<0.001). The educated mothers use HAF and continued feeds more than illiterates and it is statistically significant (p=<0.05)

Table: 4 Education of the mother and the practice of ORT.

Education of mother	ORS used		Total	X^2 value	P
	Yes	No			
Illiterate	18 (38.3%)	29 (61.7%)	261	80.5	<0.001
Literate	173 (80.8%)	41(19.2%)			
	Fluids given			X^2 value	P
	Yes	No	360	6.509	<0.05
Illiterate	83 (97.6%)	2 (2.4%)			
Literate	275 (100%)	0 (0%)			
	Continued feeds given			X^2 value	P
	Correct practice	Incorrect Practice	360	7.82	<0.05
Illiterate	52 (61.1%)	33 (38.9%)			
Literate	205 (74.5%)	70 (25.5%)			

Correct practice - same amount, more than usual amount or less than usual to eat.

Incorrect practice - nothing to eat or much less than usual

Socioeconomic status and the practice of ORT.

Since the representation from class I and class V were minimal, class I was grouped with class III and class V with class IV respectively for assessment. Mothers in class III had been administering ORS and continued feeds better than mothers in class IV and it is statistically significant. But this is not so with HAF.

Table: 5 Socioeconomic status and the practice of ORT.

Socioeconomic status	**ORS given**		**Total**	**X^2 value**	**P**
	Yes	No			
Class III	66 (80.5%)	16 (19.5%)	261	3.253	<0.05
Class IV	125 (69.8%)	54 (30.2%)			
	HAF given			**X^2 value**	**P**
	Yes	**No**			
Class III	107 (98.1%	2 (1.9%)	360	0.21	>0.05
Class IV	251 (100%)	0 (0%)			
	Continued feeds			**X^2 value**	**P**
	Correct practice	**Incorrect practice**			
Class III	76 (69.2%)	33 (30.8%)	360	4.62	<0.05
Class IV	181 (72.1%)	70 (27.9%)			

Age of the mother and knowledge on ORT

The mean age of the study population is 25 years and it is used to categorize mothers as young and old.

It was found that younger the mother poor were the knowledge on ORT and with the increase in the age of the mother the knowledge on ORT appeared to be good. But it is not statistically significant (p= > 0.05)

Table: 6 Age of the mother and knowledge on ORT

Age of mother	Knowledge on the ORT			Total
	POOR	SOME	GOOD	371
25 ≤ YEARS	41 (20.8%)	85 (43.1%)	71 (36.1%)	197
> 25 YEARS	28 (16.1%)	72 (41.4%)	74 (42.5%)	174

$X^2 = 2.170$ P = 0.338 df = 2

Number of children and the knowledge on ORT

Although mothers with greater number of children have a good knowledge on ORT than mothers with a single child, it is not statistically significant. (p= >0.05)

Table - 7 Number of children and the knowledge on ORT

No. of children	Knowledge on ORT			Total
	Poor	Some	Good	371
One child	36 (17.9%)	95 (47.3%)	70 (34.8%)	201
More than one child	33 (19.4%)	62 (36.5%)	75 (44.1%)	170

$X^2 = 4.682$ $p = 0.096$ $df = 2$

Religion and the knowledge on ORT

It is found that knowledge on ORT was more among Hindus than Christians and Muslims and it is found to be statistically significant. (Table 7)

Table: 8 Religion and knowledge on ORT

Religion	Knowledge on ORT			Total
	Poor	Some	Good	371
Hindus	43 (16.5%)	102 (39.2%)	115(44.2%)	260
Muslims	16 (31.4%)	27 (52.9%)	8(15.7%)	51
Christians	10 (16.7%)	28 (46.7%)	22(36.7%)	60

$X^2 = 16.398$ $p = 0.003$ $df = 4$

Place of seeking treatment and the use of ORS

It was found that mothers who sought treatment from a qualified person were administering the ORS solution more consistently than mothers who sought unqualified persons and it is statistically significant.

Table: 9 Place of seeking treatment and the use of ORS

ORS given	Place of seeking treatment		Total	X^2value	P
	Qualified person	Unqualified person	261		
Yes	161 (84.2%)	30 (15.8%)	191	**4.35**	**<0.05**
No	51 (72.8%)	19 (27.2%)	70		

Qualified person - medical officers and urban health nurse

Unqualified person - other source

Knowledge on the role of ORS/HAF in diarrhea management and ORS use

The ORS use had been better among the mothers who have the correct knowledge on the role of ORS in diarrhea management than who do not have the knowledge on the same and it is found to be statistically highly significant (p= <0.001).

Table: **10 Knowledge on the role of ORS and its usage**

ORS given	Role of ORS		Total	X^2 value	P
	To correct fluid loss	Others	261		
Yes	138 (97.2%)	53 (44.5%)	191	91.425	<0.001
No	4 (2.8%)	66 (55.5%)	70		

Source of knowledge on the preparation of ORS solution and the correct demonstration of procedure.

Mothers who knew about the method of preparation by reading the instructions demonstrated the correct constitution better than the mothers who knew it by the instructions given by the source of knowledge. And it is statistically highly significant. (p= <0.001)

Table: 11 Source of knowledge and the demonstration of the procedure

Demonstration	Source of knowledge on the preparation of the solution		
	As per directions in sachet	According to instructions	Total (n=272)
Correct	52 (96.3%)	146 (67%)	198
Incorrect	2 (3.7%)	72 (33%)	74

$X^2 = 18.792$ p = <0.001 df =1

Knowledge and practice

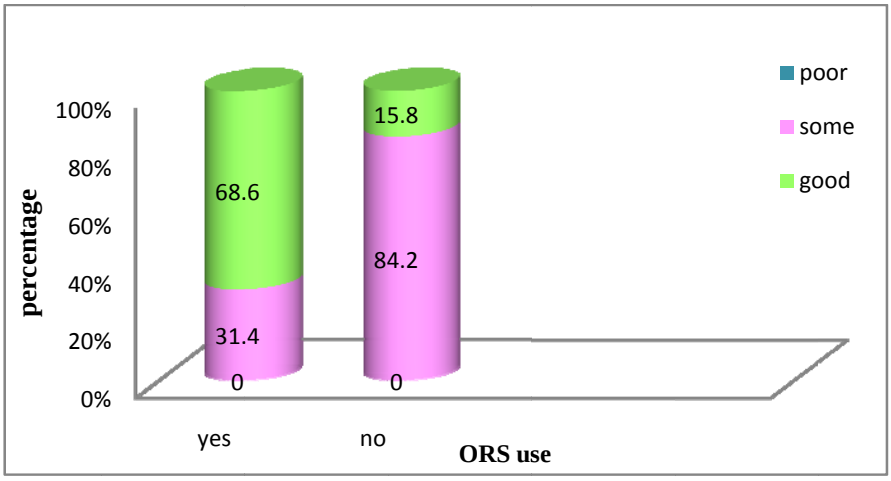
Mothers with a good knowledge on ORT had better ORS practice during the diarrheal episode of their child than mothers with poor knowledge and it is statistically significant. (p= <0.05)

Table: 12 Knowledge on ORT and ORS practice

ORS given	Knowledge on ORT			Total
	Poor	Some	Good	261
Yes	0	60 (31.4%)	131 (68.6%)	191
No	0	59 (84.2%)	11 (15.8%)	70

$X^2 = 6.966$ $p = 0.031$ $df = 2$

Figure: 20 knowledge of ORT and ORS practice



DISCUSSION

This community based cross sectional study was conducted in the slums of Agaram division in Chennai city. The chosen study population was the mothers of under-five children. The aim of the study is to assess the existing knowledge, attitude on ORT and the practices of ORT exercised by them when their under-five children experienced diarrhea and to study the various factors that are associated with the non usage of the same. The ORS use rate among the under-five children who experienced diarrhea in the previous two weeks of survey was also estimated.

Prevalence of diarrhea and health seeking behavior

In the study the prevalence of acute diarrhea among under-five children in the Agaram slums is 19% which once again reinforces the fact that diarrhea in children is an important health priority and that every effort has to be taken to control and prevent diarrhea and its sequels.

The National Family Health Survey III conducted in 2005-2006 estimated the prevalence of diarrhea among the under-five children in India as 9%. There are many other studies in different parts of India on the prevalence of diarrhea. A study done by S.C.Tiwari et al in Bhopal has reported a prevalence of 27.4%[57]. The reason may be that the study population- is more

vulnerable and that the study was done during the peak season for diarrhea. (May to August)

In the study health seeking behavior of the mothers of under-five children who had the diarrheal episode at some point of time is 89.2% and 10.8% of the mothers didn't seek treatment. The NFHS –III shows that 26% of children who suffered from diarrhea in the previous two weeks did not receive any treatment in India and in Tamilnadu it is 36.7%.This shows a positive trend in the health seeking behavior.

Knowledge on ORS and ORT

The prevalence of knowledge on Oral Rehydration Salt/solution in the study is 74.5 %. NFHS-III also shows the prevalence of knowledge on Oral Rehydration Salt/solution in India as 74% and in Tamilnadu state it is 74.1%. This study also found that with the increase in the educational status of the mother, the awareness on ORS had also increased and the difference is statistically highly significant. The study also found that Hindus had better ORT knowledge than others. But NFHS-III shows that Christians have better knowledge and usage of ORT

The study also found that medical practitioners were as a single entity the major source of information on ORS (75.5%) and health nurse contributed only 12.3%. Mass media had a minimum contribution of 7%. In the analysis of

NFHS-II results by K.V. Rao et al[53] it was observed that the mothers exposed to electronic mass media had good knowledge and its contribution is significantly high. This study has found a great fall in this aspect. The study found that only 65.1% mothers who had knowledge on ORS knew that it is available free of cost in Government health facility.

The knowledge on the correct reconstitution of the ORS solution was 72.8%. A similar study conducted by Shibani Bandyopadhgay et al[50] in Delhi found that only 10.8% of mothers correctly demonstrated the method. There is great improvement in the reconstitution knowledge.

However, the overall prevalence of the knowledge on ORT in this study is that, 18.6% have poor knowledge, 42.3 %have some knowledge and only 39.1 %of mothers had a good knowledge on ORT.

The study found that there was no knowledge on zinc supplementation in the study group. In NFHS-III also the practice of zinc supplementation was 0.3 % and in Tamilnadu it is nil. It has to be the area of focus so that the severity of illness gets greatly reduced.

Practice of ORS

The study found the ORS use in children under the age of five years who experienced diarrhea in the previous two weeks was 68.4%. NFHS-III

shows the ORS use rate of 26% in India and 32.3% in Tlnadu. This indicates that the trend is increasing in a very positive direction.

Practice of HAF

The study found that 86.1% of mothers were aware of the recommended HAF and practiced the same during the diarrheal episode of the child. The study found that only 3% of under-five children received increased fluids during the diarrheal episode. But the NFHS-III shows that increased fluids are given in 10.2% of children in India and it has been 9.6% in Tamilnadu state. There is a fall in the proportion of children who received increase fluids.

Practice of continued feeds

The study found that all children who had diarrhea in the previous two weeks received continued feeding. But among those with diarrhea at some point of time, 24.4 % of mothers did not give anything to eat and only 0.9% received increased feeds during their child's diarrheal episode. The NFHS-III shows that 4% of the children received nothing to eat and that 2% received more than usual. There exist lacunae among the study group on the knowledge of continuing feeds. Breast feeding was continued by 73.4% of the mothers and discontinued by 26.6% of them.

SUMMARY

The study was a cross sectional study done in the slums of Agaram divisions in Chennai city to assess the existing knowledge, attitude and practices of ORT among the mothers of under-five children. Most of the mothers in this study were in the 20-29 age group. Larger section of them had one under-five child. Most of them had either primary or middle school education. Majority of them were housewives and belonged to lower socioeconomic class.

The prevalence of diarrhea among the under-five children of these mothers was 19% and **ORS use rate was 68.4%.** With regard to the health seeking behavior 89.2% sought treatment for the diarrheal episode and medical officers were sought the most. Anganwadi workers were never contacted. 93.2% of mothers were aware of the health impacts of diarrhea and 78.8% of the mothers consider that diarrhea can be managed at home.

About 93.8% of the mothers knew that fluids should be given during the diarrhea episode. But with continuing foods, only 49% had the view that food should be given. 21% of mothers believed that food should be restricted during the diarrheal episode.

About **74.5% of mothers were aware of ORS** and among those who said that they knew the method of preparing it, **the correct procedure was**

demonstrated by 72.8 %. Only 64.1% knew that ORS is available free of cost in Government health facility. Medical officers were the major source of knowledge of ORS. There had never been demonstration on the method of reconstitution of the ORS solution.

The overall prevalence of ORT knowledge is that still more than 50% of the study population lack proper knowledge on ORT. There had been **no knowledge on zinc supplementation.**

The ORS use rate was 68.4%.and recommended home available fluids is 81.6%. But only **3% of the children received increased fluids** during the diarrheal episode. The preservation and administration practices were mostly good except for the volume of the fluid administered which needs improvement. Only **0.9% of the child was fed with increased food** and 24.4% were not given anything to eat. 26.6 % of mothers stopped breast feeding their child.

Lower educational status and lower socioeconomic status had negative impact on the ORT knowledge and ORS /HAF use. The age of the mother and the number of children borne by her did not have any impact on ORT knowledge. The knowledge on the role of ORS/HAF and source of knowledge had positive impact on ORS use. Mothers with better ORT knowledge had exercised better practices which is statistically significant. **Thence raising the in depth knowledge of this life saving intervention is the need of the hour.**

LIMITATIONS

- Since the data was collected from all the mothers of under-five children irrespective of the time of the diarrheal incidence the issue of recall bias may arise. Since child's health has been the top priority to every mother most of the mothers were able to recall the events.

- The study was done in only one Zone of Chennai Corporation.

- The study did not consider the details of the diarrheal episode and the associated dehydration, risk factors prevalent for the diarrhea nor on the usage of medications including antibiotics for the case management.

RECOMMENDATIONS

With waning importance, the proper knowledge on home based case management has reduced among the new cohort of under-five children's mother. In this regard from this study I would like to make the following recommendations.

- More attention has to be paid on educating the mothers about the importance of fluid replacement during diarrhea so that the practice shall be consistent.

- The various misconceptions with ORS have to be cleared in the health education process. In-depth education on **the fact that ORS is meant for fluid replacement and that it does not stop diarrhea has to be insisted upon. The importance of correct reconstitution has to be stressed upon. The mothers should be taught that taste should be given least importance.**

- **Smaller packets for smaller amount of fluids can be considered for production by the Government to avoid wastage and incorrect reconstitution**

- The health care providers should be actively involved in motivating the mothers to bring about the needed behavioral change.

- Since **visualization retains for a longer time period, demonstration of the method of preparation is the need of the hour**. The health day conducted in the sub centers should have an ORT session so that a new cohort of mothers gets educated in each meet.

- The ICDS workers who are readily available to the people should be actively involved in this task. The women self help group can be involved in this task through better training and motivation

- Since over the counter medication is widely prevalent in the country training and motivation of the pharmacist can bring significant rise in ORS usage.

- The school education system has to be planned so as to impart basic knowledge on the home management of common prevailing diseases with particular emphasis on diarrhea and ARI.

- The mass media must be utilized to the fullest potential so that even illiterates and inaccessible people can gain sufficient knowledge.

- Education on the preventive aspects of diarrhea and zinc supplementation should be given utmost priority because as the prevalence reduces mortality also gets reduced.

- **ORS and zinc supplementation tablet/syrup may be made available as a combo pack** so that usage of zinc increases

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ANNEXURE I

QUESTIONNAIRE – ENGLISH VERSION

A KAP study on ORT among mothers of under-five children

PART 1

DETAILS OF THE RESPONDENT:

1. Name: Age:

2. Marital status:

1) Married 2) Widowed

3) Divorced 4) Separated

3. Children under five years of age: [age in months]

Sex	1st order	Age	2nd order	Age	3rd order	Age
Male						
Female						

4th order and above (if present):

4. Is your child breastfed?

1) Yes [If yes, exclusive or not]

2) No

5. Religion:

1) Hindu 2) Muslim

3) Christian 4) Others

6. Education:

Education	Mother	Father
Illiterate		
Primary school [1-5]		
Middle school [6-8]		
High school [9-10]		
Secondary school[11-12]		
Graduate and post graduate		

7. Occupation :

Occupation	Mother	Father
Unemployed/housewife		
Unskilled		
Semiskilled		
Skilled		
Clerk/shop owner		
Semiprofessional		
Professional		

8. Socioeconomic class :

(acc.to modified kuppusamy scale)

PART 2

KNOWLEDGE AND ATTITUDE:

1. Have your child ever suffered from diarrhea?

   1) Yes 2) No [If no, go to question number 5]

2. If yes when did the diarrheal episode occur?

   1) In the previous two weeks 2) Prior to the previous two weeks

   [If 1) Kindly mention the number and age of the under-five children of yours who suffered from diarrhea in the previous two weeks

   A) No. of children- B) Age of the child -

3. Did you seek treatment for diarrhea from any person?

   1) Yes 2) No, I handled it myself.

4. If yes, from whom did you seek treatment?

   1) Medical officer 2) Urban health nurse 3) Anganwadi worker

   4) Neighbors. 5) Others (specify)

5. What do you think would happen if diarrhea is left untreated?

   1) Nothing will occur 2) The child's health will be affected

   3) Endangers life 4) Don't know

6. At which place do you think you can manage diarrhea?

   1) At hospital only 2) At home 3) Don't know

7. What do you think about giving fluids during diarrheal episode to your child?

   1) Should be given 2) Should not be given 3) Don't know

8. What do you think about continuing foods during a diarrheal episode to your child?

   1) Should be given 2) Should not be given 3) Don't know

9. Are you aware of oral rehydration solution for management of diarrhea?

   1) Yes 2) No [If no, go to q. number. 14]

10. If yes, from whom did you come to know about oral rehydration solution?

    1) Medical officer 2) Urban health nurse 3) Anganwadi worker

    4) Neighbors 5) Medical shop 6) Mass media

    7) Others (specify)

11. Do you know the method of preparing the solution from the ORS packet?

    1) Yes 2) No

12. How did you come to know about preparation of ORS solution?

    1) Demonstration by health care provider

    2) From the directions given in sachet.

    3) As heard from the source of information

    4) Assumption

    5) Others

13. Having known did you then really wanted to give oral rehydration solution to your child?

    1) No 2) Yes

14. What is the role ORS/ HAF in management of diarrhea?

    1) Correct the fluid loss 2) Others (specify)

15. Where do you think you can get ORS free of cost?

1) Government hospital / dispensaries/ urban health post

2) Ration shop 3) Anganwadi (ICDS) center

4) Not available 5) Don't know

16. Are you aware of any supplementation that is being recommended in diarrhea management?

1) Yes, (With the correct response of zinc) 2) No

17. Now please demonstrate the procedure of making ORS solution from this ORS packet. On observation of the task – score is

1) Correct procedure 2) Incorrect procedure

[Hand washing before the preparation practiced 1) Yes 2) No]

PART 3

PRACTICE OF ORT

(Applicable to mothers whose child had diarrheal episode in the past)

1. Was your child given ORS during diarrheal episode?

1) Yes 2) No

1.1. If no, what is the reason?

1) It is not a medicine 2) It does not stop diarrhea

3) It causes vomiting 4) It is not available

5) Do not know how to prepare 6) It is tasteless

7) Lack of money 8) Others

2. Was your child given home available fluids during diarrheal episode?

1) Yes 2) No

3. If yes, what home available fluids (HAF) did you give?

   1) Recommended HAF 2) Not recommended HAF

   [Q4-10 Applicable only to mothers who gave ORS to their child when their child had a diarrheal episode at any point of time]

4. How long you kept the prepared ORS solution?

   1) Up to 12 hours 2) Up to 24 hours 3) Until it is over 4) Others

5. Where did you preserve the prepared ORS solution?

   1) Room 2) Refrigerator 3) Others

6. How did you feed the prepared ORS solution to your child?

   1) Spoon/ tumbler /paladai 2) Feeding bottle 3) Others

7. When did you feed the prepared ORS solution to your child?

   1) After every passage of loose stools 2) After every vomit

   3) As the child asked 4) As I felt 5) Others

8. What was the approximate volume of ORS solution that you fed each time?

   1) As long as the child drank

   2) Depended on the frequency of stools

   3) Specific amount if any:

9. What you did if your child vomited while feeding ORS?

   1) Stopped feeding 2) Waited for few minutes and then gave slowly

10. Did you heat the prepared ORS solution before feeding the child?

    1) Yes 2) No

11. When your child had diarrhea how much of fluid was she /he given to drink?

    1) Much less than usual amount 2) About the same amount

    3) More than the usual amount 4) Nothing to drink

12. If the child was breast fed what you did?

    1) Stopped breast feeding 2) Continued breast feeding

13. When your child had diarrhea how much solid food was she/he given to eat?

    1) Much less than usual amount 2) Somewhat less than the usual amount

    3) About the same amount 4) More than usual amount

    5) Nothing to eat

14. What type of foods did you give to eat during and after the episode?

    1) Usual foods 2) Soft cooked foods 3) Others

15. How often you fed your child with solid foods?

    1) Same as ever

    2) Increased the frequency of feeds

    3) Decreased the frequency of feeds

THANK YOU VERY MUCH FOR YOUR COOPERATION

TAMIL VERSION

வினாப்பட்டி

பகுதி - I

பதில் அளிப்பவர் குறித்த பொது விபரங்கள் :-

1) பெயர் : வயது :

2) தங்களின் தற்போதைய திருமண விபரம் :

a) திருமணமானவர்

b) கணவரை இழந்தவர்

c) விவாகரத்தானவர்

d) கணவரை பிரிந்து வாழ்பவர்

3) ஐந்து வயதிற்குற்பட்ட குழந்தைகள் எத்தனை உள்ளன

பாலினம்	முதல் குழந்தை	வயது	இரண்டாவது குழந்தை	வயது	மூன்றாவது குழந்தை	வயது
ஆண்						
பெண்						

நான்கிற்கு மேற்பட்ட குழந்தைகள் இருப்பின் அவற்றின் விவரம்

4) தங்கள் குழந்தைக்கு தாய்பால் புகட்டுகிறீர்களா?

1) ஆம் 2) இல்லை (ஆம் எனில் அது மட்டுமே அல்லது மற்றவையும்)

5) மதம்

1) இந்து 2) முஸ்லீம் 3) கிறித்துவர் 4) மற்றவை

6) கல்விதகுதி :

கல்வி	தாய்	தந்தை
படிக்காதவர்		
ஆரம்ப கல்வி (1-5)		
நடுநிலை பள்ளி (6-8)		
உயர்நிலை பள்ளி (9-10)		
மேல்நிலை பள்ளி (11-12)		
இளம் மற்றும் முதுகலை		

7) தொழில்

தொழில்	தாய்	தந்தை
வேலை அற்றவர் / குடும்ப தலைவி		
நுட்பம் சாரா தொழில்		
பகுதி நுட்பம் சார்ந்த தொழில்		
நுட்பம் சார்ந்த தொழில்		
கிளார்க் / கடை உரிமையாளர்		
இடைப்பட்ட அந்தஸ்துள்ள தொழில்நுட்ப வல்லுனர்		
உயர்ந்த தொழில்நுட்ப வல்லுநர்		

8) சமூக பொருளாதார நிலை :

பகுதி :- 2

அறிவு மற்றும் பயன்பாடு குறித்த நோக்கம் :

1) தங்கள் குழந்தை எப்பொழுதாவது வயிற்றுபோக்கால் அவதியுற்றது உண்டா?

1) ஆம் 2) இல்லை
(இல்லை எனில் கேள்வி எண் 5க்கு செல்லவும்)

2) ஆம் எனில் வயிற்றுபோக்கு எப்பொழுது ஏற்பட்டது?

1) கடந்த 2வாரத்தில் 2) கடந்த 2வாரத்திற்கு முன்பாக

1 எனில் அந்த குழந்தையை பற்றிய விவரங்கள்:

அ) குழந்தைகளின் எண்ணிக்கை ஆ) வயது

3) வயிற்றுபோக்கு ஏற்பட்டபோது சிகிச்சைக்காக நீங்கள் யாரையாவது நாடினீர்களா?

1) ஆம் 2) இல்லை, நானே கவனித்துக்கொண்டேன்.

4) ஆம் எனில் யாரை நாடினீர்கள் ?

1) மருத்துவர் 2) சுகாதார பணியாளர் 3) அங்கன்வாடி பணியாளர்
4) பக்கத்து வீட்டினர் 5) மற்றவர்

5) வயிற்றுபோக்கின்போது சிகிச்சை அளிக்காவிட்டால் என்ன நிகழும் என்று எண்ணுகிறீர்கள்?

1) ஒன்றும் நிகழாது 2) குழந்தையின் உடல்நிலை பாதிப்படையும்
3) உயிருக்கு ஆபத்தாகும் 4) தெரியவில்லை

6) வயிற்றுபோக்கிற்கு எங்கு சிகிச்சை அளிக்கலாம் என்று எண்ணுகிறீர்கள் ?

1) மருத்துவமனை 2) வீடு 3) தெரியவில்லை

7) வயிற்றுபோக்கின் பொழுது உங்கள் குழந்தைக்கு நீராகாரங்கள் (திரவ உணவு) கொடுப்பதை குறித்து என்ன எண்ணுகிறீர்கள்?

1) கொடுக்கவேண்டும் 2) கொடுக்க கூடாது 3) தெரியவில்லை

8) வயிற்றுபோக்கின் போது உங்கள் குழந்தைக்கு தொடர்ந்து உணவு கொடுப்பதை குறித்து என்ன எண்ணுகிறீர்கள் ?

1) கொடுக்கவேண்டும் 2) கொடுக்ககூடாது 3) தெரியவில்லை

9) வயிற்று போக்கிற்கு O.R.S (வாய்வழி உடல்நீர் அற்றநிலை போக்கும் கரைசல்) மூலம் சிகிச்சை செய்யலாம் என்று அறிவீர்களா?

1) ஆம் 2) இல்லை
(இல்லை எனில் கேள்வி எண் 14க்கு செல்லவும்)

10) ஆம் எனில் யார் மூலமாக நீங்கள் O.R.S பற்றி அறீந்தீர்கள்?

1) மருத்துவர் 2) சுகாதார பணியாளர் 3) அங்கன்வாடி பணியாளர்
4) பக்கத்து வீட்டினர் 5) மருந்துகடை 6) ஊடகங்கள்

11) உங்களுக்கு O.R.S பாக்கெட்டிலிருந்து கரைசலை தயார் செய்யும் முறை தெரியுமா ?

1) ஆம் 2) இல்லை

12) கரைசலை தயார் செய்யும் முறையை எப்படி அறிந்தீர்கள் ?

1) செயல்முறை விளக்கம் கண்டு 2) தயார் செய்யும் முறையை படித்து.
3) மற்றவர் சொல்ல கேட்டு 4) யூகத்தில் 5) மற்றவை.

13) O.R.S பற்றி அறிந்த பின்னர் அதனை உங்கள் குழந்தைக்கு கொடுக்க வேண்டும் என்று உந்துதல் ஏற்ப்பட்டதா ?

1) இல்லை 2) ஆமாம்

14) வயிற்றுபோக்கிற்கான சிகிச்சையில் O.R.S / வீட்டில் கிடைக்கின்ற நீராகாரங்கள் இவற்றின் பங்கு என்ன?

1) உடல் நீர் இழப்பை சரி செய்ய 2) மற்றவை

15) O.R.S பாக்கெட் எங்கு இலவசமாக கிடைக்கும் என்று நினைக்கிறீர்கள் ?

1) அரசு மருத்துவமனை / சுகாதார மையம் 2) நியாய விலைகடை
3) அங்கன்வாடி நிலையம் 4) கிடைப்பதில்லை
5) தெரியவில்லை

16) வயிற்றுபோக்கிற்கான சிகிச்சையின் பொழுது இணைப்பாக கொடுக்கப்படும் எதை பற்றியேனும் அறிவீர்களா?

1) ஆம் (துத்தநாகம் என்று குறிப்பிட்டால்) 2) இல்லை

17) தயவுசெய்து இப்பொழுது நீங்கள் இந்த O.R.S பாக்கெட்டை பயன்படுத்தி கரைசலை தயார் செய்து காட்டவும். தயாரிக்கும் முறைக்கான - மதிப்பெண்

1) சரியான முறை 2) தவறான முறை

தயார் செய்யும் முன் கை கழுவுதல் - ஆம் / இல்லை.

பகுதி 3

செயல்முறை (வயிற்றுப்போக்கால் அவதியுற்ற குழந்தைகளின் தாய்மார்களுக்கு மட்டும்)

1) உங்கள் குழந்தைக்கு வயிற்றுப்போக்கின்போது ; O.R.S கொடுத்தீர்களா ?

1) ஆம் 2) இல்லை

1.1) இல்லையெனில், O.R.S ' கொடுக்காதற்கு என்ன காரணம்

1) அது மருந்து கிடையாது 2) வயிற்றுபோக்கை நிறுத்தாது

3) வாந்தி ஏற்படும் 4) கிடைப்பதில்லை

5) தயாரிக்கும் முறை தெரியாது 6) சுவை இல்லாத காரணத்தால்

7) பணம் இல்லாத காரணத்தால் 8) மற்றவை

2) வயிற்றுபோக்கின்போது உங்கள் குழந்தைக்கு வீட்டில் கிடைக்கின்ற நீராகாரங்களை கொடுத்தீர்களா ?

1) ஆம் 2) இல்லை

3) ஆம் எனில் எந்த வகையான நீராகாரம் கொடுத்தீர்கள்?

1) பரிந்துரைக்கப்பட்டவை 2) பரிந்துரைக்கப்படாதவை

(கேள்வி 4-10 வரை வயிற்றுப்போக்கால் அவதியுற்ற குழந்தைகளுக்கு O.R.S கொடுத்த தாய்மார்களுக்கு மட்டும்).

4) தயார் செய்த கரைசலை எவ்வளவு நேரம் வைத்திருந்தீர்கள்?

1) 12 மணிநேரம் வரை 2) 24 மணிநேரம் வரை 3) தீர்ந்து போகும்வரை 4) மற்றவை

5) தயார் செய்த கரைசலை எங்கே வைத்தீர்கள்?

1) அறையின் தட்பவெப்ப நிலை 2) குளிர்சாதன பெட்டி 3) மற்றவை

6) தயார் செய்த கரைசலை குழந்தைக்கு எவ்வாறு புகட்டினீர்கள்?

1) கரண்டி / டம்ளர் / பாலாடை 2) பால்புட்டி 3) மற்றவை

7) தயார் செய்த கரைசலை எப்பொழுதெல்லாம் குழந்தைக்கு புகட்டினீர்கள்?

1) ஒவ்வொரு முறை மலம் கழித்த பின்னர்
2) ஓவ்வொரு முறை வாந்தி எடுத்த பின்னர்
3) குழந்தை கேட்கும்போது
4) எனக்கு தோன்றும் பொழுதெல்லாம் 5) மற்றவை

8) நீங்கள் ஒவ்வொரு முறையும் புகட்டிய கரைசலின் அளவு என்ன?

1) குழந்தை பருகும் வரை
2) மலத்தின் அளவிற்கு ஏற்ப
3) அளவு ஏதும் இருப்பின் - அவை

9) ORS கரைசலை புகட்டும் பொழுது குழந்தை வாந்தியெடுப்பின் என்ன செய்தீர்கள்?

1) கொடுப்பதை நிறுத்திவிட்டேன்
2) சிறிது நிமிடங்கள் பொறுத்து பின்னர் கொடுத்தேன்

10) தயார் செய்த கரைசலை குழந்தைக்கு புகட்டுவதற்கு முன்னர் சூடாக்கினீர்களா?

1) ஆம் 2) இல்லை

11) வயிற்றுபோக்கின் போது குழந்தை பருகுவதற்கு எவ்வளவு நீராகாரம் கொடுத்தீர்கள் ?

1) வழக்கத்தைவிட குறைவான அளவு 2) அதே அளவு
3) வழக்கத்தைவிட அதிக அளவு 4) கொடுக்கவே இல்லை

12) தாய்பால் கொடுப்பவராயின் என்ன செய்தீர்கள் ?

1) நிறுத்திவிட்டேன் 2) தொடர்ந்து கொடுத்தேன்

13) வயிற்றுபோக்கின் போது குழந்தைக்கு உண்ண திட உணவு எவ்வளவு கொடுத்தீர்கள் ?

1) வழக்கத்தைவிட மிகக்குறைவான அளவு
2) வழக்கத்தைவிட குறைவான அளவு
3) அதே அளவு
4) வழக்கத்தைவிட அதிக அளவு
5) எதுவும் கொடுக்கவில்லை

14) வயிற்றுபோக்கின் போதும் அதன் பின்னரும் எந்த வகையான உணவுகளை உண்ண கொடுத்தீர்கள்?

1) வழக்கமான உணவு
2) எளிதில் செரிக்கும் உணவு
3) மற்றவை .

15) குழந்தைக்கு திட உணவு எத்தனை முறை கொடுத்தீர்கள் ?

1) எப்பொழுதும் கொடுப்பது போல
2) வழக்கத்தைவிட அதிகமுறை
3) வழக்கத்தைவிட குறைந்தமுறை

நன்றி

ANNEXURE II

Knowledge score

S no	Questions	Score
1	Knowledge on the dangers of untreated diarrhea Endangers/health affected Nothing shall occur/don't know	 1 0
2	Place of diarrhea management At home At hospital only/don't know	 1 0
3	Thought about giving fluids Should be given Shouldn't be given/don't know	 1 0
4	Thought of continuing foods Should be given Shouldn't be given/don't know	 1 0
5	Awareness on ORS Yes No	 1 0
6	Knowledge on recommended HAF Yes No	 1 0
7	Knowledge on the role of ORS/HAF Yes No	 1 0
8	Knowledge on the availability of ORS Govt health care facility Others/don't know	 1 0
9	Preparation of ORS Correct Incorrect	 1 0

Demonstration score

S.no	Demonstration task	score
1	One liter of water Others -	1 0
2	Entire sachet used Others	1 0

ANNEXURE III

MODIFIED KUPPUSWAMY'S SOCIOECONOMIC STATUS SCALE

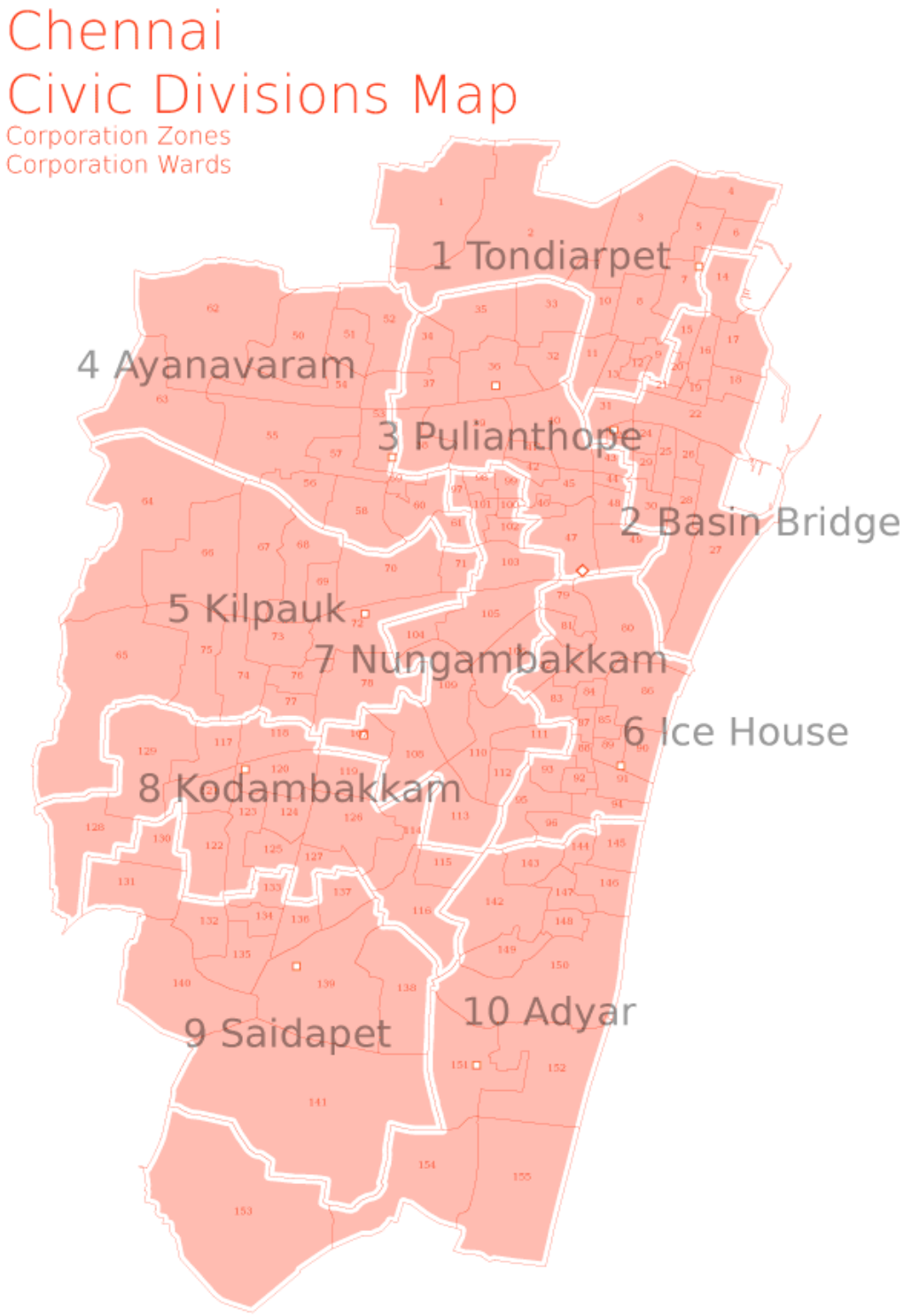
S.No	(A) Education	Score
1	Profession or Honours	**7**
2	Graduate or post graduate	**6**
3	Intermediate or post high school diploma	**5**
4	High school certificate	**4**
5	Middle school certificate	**3**
6	Primary school certificate	**2**
7	Illiterate	**1**

S.No	(B) Occupation	Score
1	Profession	**10**
2	Semi-Profession	**6**
3	Clerical, Shop-owner, Farmer	**5**
4	Skilled worker	**4**
5	Semi-skilled worker	**3**
6	Unskilled worker	**2**
7	Unemployed	**1**

S.No	(C) Family income per month(in Rs)- modified for 2007	Score
1	≥19575	**12**
2	9788-19574	**10**
3	7323- 9787	**6**
4	4894- 7322	**4**
5	2936-4893	**3**
6	980-2935	**2**
7	≤979	**1**

Total Score	Socioeconomic class
26-29	Upper (I)
16-25	Upper Middle (II)
11-15	Middle Lower middle (III)
5-10	Lower Upper lower (IV)
<5	Lower (V)

ANNEXURE IV


Chennai
Civic Divisions Map
Corporation Zones
Corporation Wards
1 Tondiarpet
2 Basin Bridge
3 Pulianthope
4 Ayanavaram
5 Kilpauk
6 Ice House
7 Nungambakkam
8 Kodambakkam
9 Saidapet
10 Adyar

ANNEXURE VI

ABBREVIATIONS

1.	UN	-	United Nations
2.	WHO	-	World Health Organization
3.	NFHS	-	National Family Health Survey
4.	DHS	-	Demographic and Health Survey
5.	ORS	-	Oral Rehydration Salt / solution
6.	ORT	-	Oral Rehydration Therapy
7.	IMR	-	Infant Mortality Rate
8.	MPHW	-	Multi Purpose Health Worker
9.	SSPS	-	Statistical Package for Social Sciences

ANNEXURE V

- **LIST OF ZONES IN CHENNAI CORPORATION**

1. Tondiarpet
2. Basin bridge
3. Pulianthope
4. Ayanavaram
5. Kilpauk
6. Ice house
7. Nungambakkam
8. Kodambakkam
9. Saidapet
10. Adyar.

- **LIST OF DIVISIONS IN ZONE IV**

1. Ayanavaram
2. Nagammaiyar Nagar- north
3. Nagammaiyar Nagar- south
4. M M A Nagar
5. **Agaram North**
6. Sembium
7. Kolathur
8. **Agaram South**
9. Siruvallur
10. Villivakkam
11. Paneer Selvam Nagar